STRATEGY RESEARCH PROJECT

JOINT THEATER MISSILE DEFENSE

BY

COLONEL HOWARD I. HARMATZ
United States Army

USAWC CLASS OF 1996

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

UNCLASSIFIED

USAWC STRATEGY RESEARCH PROJECT

JOINT THEATER MISSILE DEFENSE

by

Colonel Howard I. Harmatz
United States Army

Colonel Ronald E. Ouellette
Project Advisor

U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

AUTHOR: Howard I. Harmatz

TITLE: Joint Theater Missile Defense

FORMAT: Strategy Research Project

DATE: 1 April 1996 PAGES: 23 CLASSIFICATION: Unclassified

Since the 1991 Gulf War, the United States has recognized the critical need for a Joint Theater Missile Defense (JTMD) capability. The Department of Defense (DOD) has subsequently taken appropriate steps to develop it. In 1994, DOD established a Joint organization to manage JTMD research and development (R&D), acquisition, and structure. Then the Joint Staff developed the joint doctrine required for the conduct of synchronized Theater Missile Defense (TMD) throughout the depth of a theater of operations.

This paper briefly presents U.S. TMD initiatives to date. It identifies the threat, reviews current joint doctrine, and then presents a case that only through a true joint approach and effort will U.S. JTMD be postured to defeat any future employment of Weapons of Mass Destruction (WMD) by Theater Missiles (TM) against U.S. forces or our allies. It also makes the point that DOD needs to further take the initiative to establish a JTMD operational proponent to best synchronize JTMD operations for theater warfighting CINCs.

INTRODUCTION AND PURPOSE

Since the 1991 Gulf War, the United States has recognized the critical need for a Joint Theater Missile Defense (JTMD) capability. The Department of Defense (DOD) has subsequently taken appropriate steps to develop it. In 1994, DOD established a Joint organization to manage JTMD research and development (R&D), acquisition, and structure. Then the Joint Staff developed the joint doctrine required for the conduct of synchronized Theater Missile Defense (TMD) throughout the depth of a theater of operations.

This paper briefly presents U.S. TMD initiatives to date. It identifies the threat, reviews current joint doctrine, and then presents a case that only through a true joint approach and effort will U.S. JTMD be postured to defeat any future employment of Weapons of Mass Destruction (WMD) by Theater Missiles (TM) against U.S. forces or our allies. The paper concludes with a recommendation that DOD establish a JTMD operational proponent to best synchronize and train JTMD forces/procedures for the warfighting CINCs.

DEFINITIONS

Joint Pub 3-01.5 defines "theater missiles" and "theater missile defense" :

> a. Theater missiles (TM) are categorized as ballistic missiles, cruise missiles and air-to-surface missiles whose targets are within a given theater of operations.
>
> b. Theater missile defense (TMD) is the identification, integration, and employment of forces supported by other theater and national capabilities to detect, identify, locate, track, minimize the effects of, and/or destroy enemy TMs. This includes the destruction of TMs on the ground and in flight, their ground-based launchers and supporting infrastructure;TM capable ships and vessels in port or a sea; and enemy aircraft armed with air-to-surface missiles.[1]

BACKGROUND

In the summer of 1990 the United States Department of Defense had no capability to protect U.S. forces from the emerging threat of TBM delivered WMD. In fact, the U.S. had

only a token R&D effort toward that end; no acquisition funds had been dedicated to the development of any theater missile defense capability. Then Iraq invaded Kuwait. As our top civilian and military leaders were developing a U.S. response, they began to wonder what defensive capability we had against theater missiles. Unfortunately, the answer was nothing. We had not developed a system dedicated to that threat.

The U.S. Army Air Defense Artillery branch and Raytheon Corporation, however, were in the process of testing an advanced Patriot missile. This missile was being designed to intercept enemy anti-radiation missiles (ARM) that could be fired at Patriot air defense sites in the event of a conflict with the former Soviet Union. This anti-missile missile was initially designed as a self-defense mechanism for Patriot only. It was never envisioned for use in a force protection role or to protect allied civilian areas, as it came to be utilized during Desert Shield and Desert Storm. Fortunately Saddam Hussein provided us the time we needed to identify our need for defense against TBM-delivered WMDs. So we quickly developed an initial TMD course of action and aggressively refined and enhanced the Patriot self-protection system to provide a limited TMD capability. From August 1990 to March 1991, Patriot TMD development and thus U.S. TMD capability advanced at a record pace. Raytheon and Army engineers worked around the clock to provide the most accurate and capable system, while producing a sufficient number of missiles to meet the perceived threat. As a result, Patriot was in place and ready when Desert Storm commenced on 17 January 1991; it played a vital role in the Coalition Force victory. It also established the critical framework for the much more robust TMD program that has since evolved.

After Desert Storm, the theater missile threat has become a serious concern for the

United States and its allies. In the summer of 1991 a commission was appointed to analyze the threat and review Patriot performance during the Gulf War. Although Patriot performance was severely criticized, the commission recognized that a credible missile-on-missile defense was achievable. It further acknowledged that TMD must be more comprehensive then just a defensive initiative. The first Missile Defense Act was passed in 1991 and refined with the Missile Defense Act of 1993, which outlined a U.S. Theater Missile Defense initiative. In March 1994 the Joint Staff published Joint Pub 3-01.5, Doctrine for Joint Theater Missile Defense. Then in June 1994 the Secretary of Defense established the Ballistic Missile Defense Organization (BMDO). The joint doctrine established the basic guidance and direction for DOD JTMD initiatives, and BMDO set out to manage the program. BMDO, a joint organization under the Under Secretary of Defense for Acquisition and Technology was designed to manage, direct and execute the Ballistic Missile Defense program to ensure: continuation of advanced TMD technologies and research, development of viable options for National Missile Defense, and a rapidly deployable TMD capability. In this capacity, BMDO is the DOD source for funding of all service TMD system development and acquisition, and has devised a truly joint acquisition strategy tailored to support the tenets of JTMD doctrine.

THREAT

The threat of a hostile nation's or terrorist faction's employment of theater missiles against U.S. forces, allied forces or allied political targets of opportunity is legitimate today. This threat will only increase in likelihood as we move into the 21st Century.

As a result of Iraq's use of TMs against civilian, political and military targets in Israel and Saudi Arabia during the Gulf War, third world nations see the TM as a low technology,

low cost means of employing WMD against civilian and/or military targets to quickly achieve desired political and strategic military ends. During Desert Storm, Iraq demonstrated how difficult it is to detect, track, and engage ground launched TM systems. Iraq further demonstrated that when accurately employed, how effectively these weapons can disrupt opposing military operations and civilian tranquility. The United States, on the other hand, demonstrated how easily a superior air force could neutralize or deter planned enemy air operations by destroying air assets quickly or precluding their employment through clear air superiority. The lesson learned form this is that third world nations, with only limited funds available for defense, understand that it makes more sense to spend those funds for the lower cost TM capability vs a high cost, high maintenance air force that may not influence the fight anyway. As a result, the proliferation of TMs has become widespread throughout the world.

In addition to Iraq, five third world countries have actually fired ballistic missiles at opponents (Iran, Egypt, Syria, Libya and Afghanistan).[2] Current trends suggest that the number of countries with missiles will only increase through the late 1990's and into the 21st century, and system capabilities will continue to grow.[3] Since 1989, the number of countries possessing intermediate range ballistic missiles, with ranges from 70 Km to 4,750 Km has increased from 23 to 34.[4] All of these increases took place in third world countries, and this development increased the total number of nations possessing ballistic missiles of all ranges to 43.[5]

With TMs, third world nations gain a legitimate and effective capability to strike first as part of a premeditated offensive thrust or as a preemptive action during a crisis.[6] Additionally, TMs can be employed as weapons of last resort or terror when a nation

perceives it has no other option or desires to make a political statement.[7] In fact, missile equipped nations may not need to use large numbers of missiles to cause dramatic political change in a region, because the mere threat or subsequent use of even a few weapons may be sufficient to achieve a regional goal.[8]

Joint Pub 3.01-5 outlines the TM threat, which includes but is not limited to, five essential components. These components allow us to assess the threat and justify the development of a fully integrated JTMD program:

> a. International missile attack or the threat of attack on a nation.
> b. Limited attack of population centers or critical assets to achieve political benefits.
> c. Denying merchant shipping the freedom of navigation through waters outside of internationally recognized territorial limits.
> d. Employment of TMs against tactical, operational and strategic military targets to gain a military advantage.
> e. Unauthorized or accidental launch of missiles.[9]

JOINT DOCTRINE

To establish a doctrinal foundation for meeting the TM threat in the near term and well into the 21st Century, The Joint Staff produced and published Joint Pub 3.01-5, Doctrine for Joint Theater Missile Defense in March 1994. In the first chapter, the Joint Staff outlined the five principal objectives for JTMD. This set a focus for the doctrine that follows and established the program's benchmarks. The five objectives are as follows:

> a. To demonstrate U.S. resolve to deter aggression through the establishment of a TMD capability.
> b. To protect U.S.-deployed, allied, and coalition forces, and critical assets and areas of vital interest or political importance from attack by TMs.
> c. To detect and target TM systems; to detect, warn, and report a TM launch; and to coordinate a multifaceted response to a TM attack, integrating that response with other combat operations.
> d. To reduce the probability of and/or minimize the effects of damage caused by a TM attack.

e. To ensure that the JFC has the freedom to conduct joint operations without undue interference from TM operations conducted by the enemy.[10]

Utilizing these five objectives, JP 3.01-5 outlines a general but comprehensive JTMD program, offering discussions on the JTMD operational environment, perceived threat, JTMD organization structure, and guidance for allied and coalition JTMD planning and operations. The key to JP 3.01-5, however, is its identification and development of four principal pillars for JTMD: Passive Defense, Active Defense, Attack Operations, and C4I (command, control, communications, computers and intelligence).[11] These pillars, though discussed separately, require integrated planning and execution to ensure a seamless TMD program.

PASSIVE DEFENSE

The first pillar, passive defense, provides foundation for all JTMD operations. Passive defense is essential to ensure protection of friendly forces, population centers and critical assets, regardless of the environment within which U.S., allied and coalition forces are operating, or the TM capabilities of the threat. "Passive defense consists of measures taken to protect U.S. forces, allies, and population centers against a TM attack. These measures reduce the casualties and destruction caused by TMs which penetrate active defense systems, and from the debris caused by a successful active defense engagement."[12] JP 3.01-5 specifies four measures designed to accomplish passive defense: tactical warning, reducing targeting effectiveness, reducing vulnerability, and recovery and reconstitution.[13]

JP 3.01-5 states that tactical warning triggers passive defense actions. The pub also notes that warnings are both general (that missile launches are imminent or have occurred) and specific (that specific units or areas of the battlefield or theater are in danger of attack).[14] Theater CINC tactical warning requirements are supported by both national and theater

intelligence systems, and effective passive defense depends largely on the speed and accuracy of these intelligence systems.

Our methods for reducing target effectiveness, however, essentially preclude an enemy from finding and targeting our forces or critical assets. Thus, key to all passive defense operations is denial of critical targets to the enemy. JP 3.01-5 identifies three major methods of depriving the enemy of targets: operations security (OPSEC), deception and mobility.[15] By denying the enemy information on friendly force disposition, plans, and intentions through effective OPSEC, we reduce his ability to target us when we are most vulnerable and thus achieve effective passive defense. As with all other military operations, successful deception for JTMD passive defense influences the enemy to apply TM assets at false targets and thus preclude those assets from being employed against friendly force positions or assets. Mobility simply reduces vulnerability and contributes to survivability of certain systems by limiting exposure to reconnaissance and targeting.[16]

The third component of passive defense, reducing vulnerability, deals predominantly with self protection and involves both individual and collective initiatives. Reduced vulnerability is achieved by hardening of positions, facilities, supplies, equipment, forces and communications centers and nodes; dispersal of forces and equipment; redundancy or duplication of critical capabilities that are particularly vulnerable to TM attack; effective NBC defensive measures; and the training local civilian authorities to organize and instruct their populations on actions to take on warning of missile attack.[17] Each defensive tactic is significant in its own way. All measures to reduce vulnerability, however, require chain of command support and soldier training, as well as leader knowledge of when to apply what

initiative to maximize their effectiveness.

The final component, recovery and reconstitution, applies to those actions taken following a TM attack that allow our forces to be restored to a desired level of combat effectiveness commensurate with mission requirements and available resources.[18] This is really nothing new. Although the magnitude of recovery and reconstitution after TM attack might be greater than that from conventional operations, the process follows already established joint and individual service procedures and the services are familiar with such operations. But we must actively practice them during joint exercises to develop inter-service working relationships and a feeling for dealing with losses of higher magnitude as a result of TM employed WMD.

ACTIVE DEFENSE

The second pillar, active defense, is simply those actions taken to protect selected assets and forces from attack by destroying TM airborne launch platforms and/or TMs in flight.[19] JP 3.01-5 notes that active defense operations must consist of defense in depth against all classes of TMs, to include ballistic and cruise missiles. It further notes that when destruction of the TM launch platform prior to launch is not possible or successful, TMs should be engaged by all means available throughout their entire flight profile.[20] These active defense operations, however, require close joint coordination and synchronization to ensure maximum effectiveness. They also require a thorough understanding of threat capabilities, most likely threatening TM courses of action, and the threat's most dangerous courses of action, to determine the best array of JTMD forces. Risk is always an issue, so a scrupulous risk assessment must be performed. Redundancy of protection is a concern as well; it is often

essential to ensure defense in depth for key political areas of concern or consolidated military forces.

JP 3.01-5 states that:

> a. The Joint Force Commander (JFC) exercises control of active defense operations by integration of JTMD systems and forces into the C4I systems supporting theater air defense.
>
> b. The JFC normally assigns overall responsibility for theater air defense, to include active defense TMD, to the Area Air Defense Commander (AADC).
>
> c. Active defense forces are under the operational control of their component commanders, who employ these forces under the weapons control procedures and measures established by the AADC and approved by the JFC.[21]

The services do not agree on implementation of active defense. The Army and Navy contend that, in accordance with this joint doctrine, their respective component commanders within a joint force retain active defense positioning authority of component TMD assets while they support a joint operation. The Air Force, on the other hand, believes that TMD is a subset of counter-air operations. As such, active defense asset positioning falls under the AADC and/or the Joint Force Air Component Commander (JFACC).[22] Valid arguments support each position. This is a critical issue that must be resolved as JTMD doctrine and operational procedures continue to evolve.

ATTACK OPERATIONS

Attack Operations, the third pillar of JTMD, designate those offensive operations dedicated toward the destruction and/or the disruption of enemy TM capabilities, before, during and after launch.[23] JP 3.01-5 defines attack operations as those actions taken to prevent the launch of TMs by attacking each element of the overall system, including actions taken to destroy launch platforms, RSTA platforms, C2 nodes, and missile stocks and infrastructure.[24] The pub further notes that attack operations also strive to deny or disrupt

employment of additional TMs that may be available to the enemy.[25]

Although they are the most effective means of defeating the enemy TM threat, attack operations are also the most difficult to carry out. Attack assets, such as fixed and/or rotary wing aircraft, special operating forces (SOF), deep attack artillery and naval gunfire, must be available on short notice to execute counter TM actions. Intelligence must be timely and accurate, and operations should focus on preemptive, not reactive, initiatives. JP 3.01-5 notes that the preferred method to defeat the TM threat is to attack and destroy or disrupt TMs prior to their launch, with emphasis on factories and TM storage areas.[26] Launch platforms must also be targeted and destroyed early on just as Air Force and Army aviation operations seek to suppress enemy air defenses on the ground (SEAD). As occurred during Desert Storm, future initial TMD attack operations may achieve only limited success. Thus, JTMD intelligence must be an ongoing process that provides the most current post launch information for timely follow-on attacks. This facilitates aggressive and sustained attacks on launch platforms, as well as the factories and storage sites, to defeat this threat in detail over time.

COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS & INTELLIGENCE

The final pillar, C4I, is essential for the successful execution of each of the other three pillars individually and collectively. It "links passive defense, active defense, and attack operations to provide timely assessment of the threat; rapid dissemination of tactical warning; and mission assignment, targeting data and post-strike assessment to the appropriate JTMD element."[27]

> For each operational element, the C4I system must provide rapid communications among intelligence assets, the fusion and decision making facilities, warning systems,

and weapon systems, to include a capability for rapid coordination with supporting CINCS.[28]

Space assets, in particular, are critical to the first three pillars of JTMD because, as JP 3.01-5 stresses, they provide accurate and timely launch warning, launch point prediction, threat type determination, as well as impact point prediction.[29] Joint doctrine further outlines three critical requirements for JTMD C4I:

> a. Passive defense measures require providing threat identification (conventional or NBC) detecting a launch, predicting the impact points, and timely warning.
> b. Active defense requires early detection of airborne launch platforms and missiles in flight to permit cuing, acquisition, tracking, identification, and destruction in flight.
> c. Attack operations require accurate location of launch platforms and support systems, timely transmission of targeting data to attack systems, and accurate combat assessment.[30]

The Services must make maximum use of existing intelligence gathering assets, along with fire control and communications systems, to ensure the most effective JTMD C4I in the near term. Ongoing initiatives for communications enhancements and equipment inter-operability will provide the most timely and accurate data flow possible for JTMD within the next few years. Taken together, these two initiatives, then, will facilitate effective synchronization of the other three pillars into the 21st Century.

THE JOINT ISSUE

Synchronization of all the pillars, and effective and efficient joint cooperation and integrated actions, are clearly vital to a successful JTMD effort. In today's constrained DOD, no one service can exclusively meet the TMD challenge. JTMD planning, preparation and execution, with Regional CINC oversight and involvement, must be exercised and executed as true joint operations. Funding constraints, manning ceilings and varying service

capabilities/limitations mandate jointness. Each service has an important role to play for DOD to accomplish the established JTMD objectives. While the services may play a larger or smaller role for each pillar of JTMD, their complete cooperation, coordination and inter-operability are required to ensure effective operations of a particular pillar, and the most effective integration of all the pillars. We will now analyze each pillar independently, and indicate the criticality of joint operations to the overall success of that pillar. Then we will show how comprehensive C4I serves to maximize the joint effort in TMD planning and operations.

PASSIVE DEFENSE

As noted earlier, passive defense includes those measures taken to protect U.S. forces, allies and population centers from TM attack. Planning for passive defense begins with the development of Intelligence Preparation of the Battlespace (IPB).[31] Execution of passive defense hinges on timely and accurate tactical warning, comprehensive measures to reduce target effectiveness, and well planned measures to enhance survivability. While all these initiatives are essential for a thorough passive defense plan, IPB and tactical warning require joint integration, preparation, and execution to maximize the overall joint passive defense initiative.

The IPB is essential early on for successful joint passive defense operations. JTMD planners must be able to visualize enemy air, ground, and sea operations in order to predict when and where the enemy will employ TMs to support his operations.[32] A single service cannot successfully meet this requirement in and of itself. IPB is a joint mission; and the services are working hard to provide a timely and accurate IPB component capability for the

JFC.[33] The Army has refined the process during the 1980's as intelligence preparation of the battlefield. This has evolved to intelligence preparation of the battlespace in joint doctrine.

Threat evaluation requires detailed analysis of enemy air, ground, and sea TM quantities, types, capabilities, delivery systems, locations, doctrine, and potential intent.[34] While satellite observation and aerial reconnaissance are the most critical components of this initiative, ground and sea involvement is essential for a thorough threat evaluation.

Battlespace area evaluation and terrain analysis for JTMD must also involve detailed air, ground, and sea assessment and component/service integration at the joint force level. Army, Air Force and Navy priority intelligence requirements (PIR), although often independently developed, must be coordinated, consolidated and prioritized as a joint initiative to maximize and focus joint intelligence gathering efforts.

> Once the AO (area of operations) and AI (area of interest) have been established, the terrain must be analyzed by looking closely at observation and fields of fire, cover and concealment, obstacles, key terrain, and avenues of approach (OCOKA) to determine the effect of that terrain on TMD operations. During this analysis, the TMD planners determine probable ballistic and cruise missile launch points, hide positions, movement routes, etc.[35]

Weather analysis, while an air component and joint space mission, is essential for air, ground and sea passive defense planning and operations. Accurate and timely analysis is especially critical to the IPB input for ground and sea operations. Weather impact on timing of movement and concealment of ground and sea forces from air reconnaissance is a vital consideration. Adverse weather, for example, could greatly slow both ground and sea movements, while at the same time provide sufficient concealment from aerial reconnaissance. The reverse would be true for clear weather conditions.

Threat integration, the final phase of the JTMD IPB process, requires the IPB planners

to put everything together to produce the products of the IPB analysis: a situation template, an event template, a decision support template and matrix, and an execution matrix.[36] Each one of these initiatives results from joint input, analysis, and evaluation, and as such is a joint product. Failure to properly reflect a particular component's role or concerns would produce an incomplete and flawed effort.

The tactical warning component of JTMD passive defense has truly been a joint effort from its inception. Since the Gulf War, USSPACECOM has the mission to provide space-based early warning of enemy ballistic launches to a theater of operations; USSPACECOM utilizes equipment and programs collectively termed the Tactical Event System (TES) to perform this mission.[37] As a principal component of the TES, Defense Support Program (DSP) satellites provide the space-based ballistic launch detection; then fixed and mobile DSP data processors forward launch detection and missile parameters to the USSPACECOM Combat Operations Center and/or directly to a theater for strategic, operational or tactical application.[38] Three systems are currently in place to receive DSP satellite transmissions:

a. The Joint Tactical Ground Station (JTAGS), cooperatively developed by the Army and Navy during 1991 through 1992 for use in theaters of operation.

b. The Attack and Launch Early Reporting to Theater (ALERT) system, developed by the Air Force from 1993 through 1994 and fielded for U.S. use in 1995.

c. The Tactical Data Reporting (TACDAR) system, developed by the Navy and fielded in 1994 for sea based tactical data processing.[39]

These three systems and the DSP satellites collectively make up the TES. This is really a joint system; National, Army, Air Force, and Navy components are required to

function together for the total system to operate. "For instance, when JTAGS is deploying, ALERT and TACDAR may have to assume the tactical data processing responsibilities for the theater."[40] In general, however, "whether during a conflict, or in day-to-day operations, tactical missile warning support to a theater CINC may be provided by all three DSP mission processing systems, JTAGS, ALERT, and TACDAR."[41]

ACTIVE DEFENSE

As we have seen, the active defense pillar is simply comprised of those actions taken to protect selected assets and forces from attack. Active defense calls for destroying TM airborne launch platforms and/or TMs in flight. The JFC apportions all TMD active defense forces, normally keeping them under the operational control of their component commanders, with overall responsibility for TMD active defense belonging to the AADC.[42] As a result, component commanders employ active defense weapons to support component tactical and operational requirements, but they must adhere to the ROE established by the AADC and approved by the JFC. This is not a simple relationship. It requires well-coordinated joint plans, practiced by joint forces during joint exercises. Joint procedures, joint thinking and joint teamwork are all necessary to make these relationships work. A parochial single service/component approach or attitude held by any member of a joint force will spell disaster for the total force. We do not have enough active defense TMD assets available to override poor service and component command coordination.

The bottom line for active defense is that we have a very limited capability today. The Army will eventually have a lower and upper tier complementary capability - with Patriot (PAC-3) comprising the lower tier; and a new system, the Theater High Altitude Area

Defense (THAAD), the upper tier. Patriot (PAC-3) is a much more capable TMD system then its predecessor, Patriot (PAC-2). PAC-3 fielding will begin in 1998, and it will offer improved lethality against TBMs with a hit to kill capability, an increased protected area, an improved target discrimination and a greater low altitude performance. There are, however, only ten total Patriot battalions in the Army inventory. Six Patriot battalions are stationed in the U.S. (one of which is in the Alabama National Guard); three are stationed in Germany; one is deployed to Korea; and one (from the U.S. or Europe) is positioned on a rotating basis in the Middle East. THAAD will eventually be a very capable upper tier system, with greater range and lethality than Patriot. It is, however, at least six years away from initial operational fielding, and only two battalions are projected to be fielded.[43]

The Navy is also developing a lower and upper tier capability to be based on Aegis Ticonderoga-class cruisers and Arleigh Burke-class destroyers. The lower tier system will protect fleet concentrations, ports, coastal airfields, amphibious objective areas, and expeditionary forces. The upper tier system will provide long-range, wide-area defense of joint forces, cities, vital assets, and inland regions within an entire theater of operations. Navy's lower tier is projected for initial fielding in the year 2000, and upper tier six to eight years after that.[44]

Although Army and Navy joint force component commanders will probably retain operational control of their TMD active defense assets, they must closely coordinate TMD active defense system positioning at the joint force command level during all phases of joint operations. Existing and projected systems are simply insufficient to do otherwise. While Navy systems will principally provide the capability to protect the fleet, they can also provide

complementary or redundant coverage for ground forces or other designated areas on land. Army systems, on the other hand, are principally employed to protect ground forces and designated critical land areas, but they can also provide complementary and/or redundant coverage for off-shore naval ships. A recent article by Robert M. Soofer of the Ballistic Missile Defense Organization (Joint Forces Quarterly, Autumn 1995) supports this point. Soofer particularly promotes system component inter-operability as a means to best manage limited assets:

> One way to maximize limited active defense assets is to develop and deploy land, sea and air based TMD systems with the ability to detect track and control missiles. An example used by the Vice Chairman, Admiral William Owens, in an article published last year in JFQ, is to deploy land-based acquisition and fire control radar in theater to control missile interceptors off shore by sea-based platforms. Not only would this extend the range of sea-based defenses, which are limited by the line of sight radar on Aegis ships, but also ease demands on airlift by obviating the early need for land-based launchers and missiles. Likewise, sea-based radars can pass acquisition and tracking information to land-based systems already in place.[45]

This progressive attitude toward JTMD active defense is the only way to go. It is precisely the approach the JCS and theater CINCs are advocating.

ATTACK OPERATIONS

The DOD has come a long way in understanding and refining joint TMD attack operations since the collective poor performance of that mission during Desert Storm. The Air Force recognizes its role as a major contributor toward the development and implementation of this function in the air campaign. It is working closely with the other services to develop and exercise joint operational TMD concepts and capabilities to attack the breath and depth of the enemy TM target system.[46]

Responsibility for preparation of the joint attack operations plan and counter TBM

portion of the air campaign rests with the JFACC, in coordination with other service component and Special Operations Command (SOCOM) counterparts.[47] Execution, then, is a joint mission, performed by Air Force, Army, Navy, Marine, and SOCOM assets, based on a joint IPB and METT-T (mission, enemy, troops, terrain and time) analysis.

As with passive defense, IPB provides attack operations planners critical threat information to assist them in planning attack operations. Specifically, it will identify such high payoff targets as forward operating TBM bases, command and control nodes, hide sites, pre-surveyed launch sites and connecting roads in TBM operating areas.[48] This information - generated by Air Force reconnaissance, ground special force sightings, Army unmanned aerial vehicle (UAV) observations and satellite launch detections - is continuously updated and quickly passed to JTMD planners for follow-up analysis. Based on the information available, planners assign targets and allocate the joint forces most available and/or best suited to accomplish the mission.

This process was validated during a recent joint exercise, Roving Sands '95, conducted in and over a large portion of southern New Mexico. Throughout the exercise, joint forces successfully located and attacked the breath of enemy TBM. Army special forces of the 5th Special Forces Group were deployed behind exercise enemy lines with the mission of locating enemy TM launchers. They successfully pinpointed and reported more than 50% of the enemy exercise launchers without being detected.[49] The Army also employed a medium altitude UAV prototype, the Predator, during portions of the exercise; it provided significant real-time targeting information for use by joint planners and attack platforms.[50] As a result, air planners were able to allocate 17% of the joint air effort (Air Force F-15Es and Marine

Corps F-18s) toward TM attack operations, and these air frames attritted enemy TBM infrastructure (launchers, cranes and support equipment) by 40%.[51]

Army attack aviation has proved to be a key player in JTMD attack operations as well. During Desert Storm, the only known successful kills of Scud launchers were accomplished by attack helicopters of the 160th Special Operations Aviation Regiment.[52] Key to the Army aviation success in this role is a rapid response capability, easy visual or enhanced target identification, and the ability to provide real-time battle damage assessment (BDA).[53] Army aviation was also a major participant in Roving Sands '95, with significant launcher and infrastructure kills and BDA. In one situation, UAV video of simulated target positions was quickly passed to III Corps attack aviation planners. "Apache attack helicopters flew to the vicinity of the confirmed targets, acquired the targets on their gun cameras and conducted simulated engagements."[54]

In a recent article on TMD that appeared in the Autumn '95 JFQ, Air Force Chief of Staff, General Ronald R. Fogleman asserts that DOD has a firm grasp on the JTMD attack operations mission and is prepared to vigorously execute it:

> Preemptive precision strikes against point targets and application of denial weapons will greatly hinder enemy near-term TBM activity. Meanwhile, lethal precision attacks against the TBM support tail will undercut long-term operations. Enemy preparations for mobile TBM launch at or near a launch site offer an excellent opportunity to identify and destroy a TEL (transporter-erector-launcher) with lethal air strikes and thus prevent launch. If an enemy launches a mobile TBM, detection of the launch will key our attack operations. We will capitalize on overhead and surface sensors, special operating forces, JSTARS, AWACS, Rivet Joint aircraft, U-2s, and unmanned aerial vehicles (UAVs). The inputs will identify the launch point and cue Air Force and other service assets for time-critical strikes.[55]

General Fogleman also notes that numerous significant on-going joint initiatives will streamline and enhance attack operations in the near future, providing the U.S. with a timely,

capable, and robust JTMD attack operations component.

The bottom line is that attack operations is a "team sport". All players must contribute and work together to achieve a common objective. No one service/component, in and of itself, can win the day. Victory will come only from a well-exercised total team effort, where cooperation and practiced inter-operability focus all joint attack capabilities toward maximum joint synchronized application.

COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS & INTELLIGENCE

Our doctrinal review identified C4I as the lynch pin for successful synchronization of the other three JTMD pillars. The Tactical Event System (TES) and intelligence preparation of the battlespace (IPB), identified during the discussion of passive defense operations, provide the process and key intelligence information that support this pillar.

Within the past 18 months both the Army and Air Force have worked hard to develop prototype tactical operations centers for JTMD C4I management and execution. These centers have been developed to receive sensor data from space-based assets, joint radar systems and other intelligence sources. They quickly employ flash targeting and warning information throughout the theater, and then coordinate appropriate passive defense, active defense and attack operations initiatives.

The Army's Force Projection Tactical Operations Center (TOC) was extensively tested during Roving Sands '95 and "clearly demonstrated its capability to build operations synergy."[56] Time and again, its soldiers processed key intelligence data quickly and coordinated and/or initiated the appropriate JTMD response. As LTG Jay M. Garner, Commander of the Army Space and Strategic Defense Command, observed in his recent

article "Force Projection TOC; A Command and Control Solution":

> The Force Protection TOC rapidly received and disseminated notice of Scud launches processed through the Joint Tactical Air Ground Station (JTAGS). The passive defense cell immediately passed the JATAGS-predicted impact point message to threatened units throughout the theater. Simultaneously, selected Patriot fire units began engaging the incoming Scuds, while the Force Projection TOC's "gun line," consisting of its intelligence and attack operations crew, coordinated ATACMS and Marine Corps attacks against targets in the launch area. This joint operation demonstrated streamlined reaction times and the value of a TMD coordinator and a support staff to lay the groundwork for rapid, theater level response.[57]

The Air Force also tested a JTMD Combat Integration Center (CIC) during Roving Sands '95. The CIC achieved some success by employing various decision aids to recommend offensive and defensive actions against a specific TBM threat.[58] It also gained robust connectivity with sensors and shooters throughout the theater, and its operators routinely processed center inputs and tasked attack assets within one to two minutes.[59] Based on the lessons from Roving Sands '95, the CIC has been stood down for redesign and reconfiguration. It is projected to be operational once again for testing and deployment in 18 to 24 months.

These prototype JTMD management centers provide the JFC with a critical C4I synchronization capability today. Continued development, testing, and coordination between the services is absolutely essential, however, to ensure the more robust and inter-operable JTMD program as we transition to the next century. General Fogleman stresses this point:

> ...we must not undo improvements made in integrating all types of intelligence into our combat infrastructure and architecture. The stresses placed on a commander's C4I to deal with time-critical targets, particularly TBMs, make it essential that imagery be integrated as a seamless element of his operations.[60]

CONCLUSION

The DOD has come a long way in developing a JTMD capability to deter and defeat

the TM threat since the Desert Storm experience. Each service, in coordination with BMDO management and established joint doctrine, has been an essential player in the evolving JTMD program. Key to all the initiatives, however, is the necessity for jointness. Clearly, no one service or joint force component can meet the threat alone. Each pillar of JTMD requires joint integration and coordination for maximized execution and success.

In addition to the critical requirement for continued joint development and integration, DOD must take the lead to implement a JTMD operational proponent. DOD has a capable JTMD acquisition proponent in BMDO. The Joint Staff has provided the doctrinal foundation for comprehensive JTMD acquisition and operational procedures. The services have made great strides in developing a robust and integrated initial JTMD capability. The missing component is a joint operational proponent. When established, this proponent would be responsible for integrating the four JTMD pillars for DOD, and focusing JTMD execution to support regional CINC/theater requirements. This proponent could be organized and staffed under USSPACECOM, and be structured to support two simultaneous regional contingencies. As an element of USSPACECOM, such a JTMD operational proponent would be free of the biases of the individual services and be under the oversight of the Chairman of the Joint Chiefs of Staff. In this capacity, the JTMD operational proponent would have the responsibility to coordinate and integrate the evolving service TMD command and control centers to best synchronize the four JTMD pillars and elements of each pillar. The JTMD operational proponent would also be charged to ensure that JTMD operations are adequately played during future joint exercises, and that regional JTMD plans and procedures meet the specifications outlined in joint doctrine and standard operating procedures.

This research paper has examined the JTMD program in detail - outlining the threat through the early years of the next century and reviewing the joint doctrine established to defeat it. Based on detailed analysis of each pillar of JTMD, it has also built and supported the case for joint TMD operations; and concluded with a recommendation for the integration of a joint operational proponent to best synchronize further operational development, training, and execution. The paper substantiates that Theater Missile Defense is clearly a joint responsibility and explains why no one service can independently manage it. Finally, it makes the point that the success of future JTMD readiness will be contingent upon continued joint developmental and operational integration.

END NOTES

1. The Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense, Joint Pub 3-01.5 (Washington: The Joint Chiefs of Staff, 30 March 1994), p. I-2.

2. W. Seth Carus, "Ballistic Missiles in the Third World," The Washington Papers - Center for Strategic and International Studies, Washington, D.C. (New York: Praeger, 1990), p. 1.

3. Ibid., p. xvii.

4. Duncan Lennox, "Missile Race Continues," Janes Defense Weekly, 23 January 1993, pp. 18-21.

5. Joseph F. H. Peterson, "Ballistic Missile Proliferation a National Security Focus for the 21st Century," Strategic Research Project, USAWC, 18 April 1994, p. 6.

6. Ibid.

7. Ibid.

8. The Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense, p. I-6.

9. Ibid.

10. Ibid., pp. I-1, 2.

11. Ibid., pp. I-3, 4.

12. The Joint Chiefs of Staff, Joint Theater Missile Defense CONOPS, J-36, (Washington: The Joint Chiefs of Staff, 17 February 1995), p. 45.

13. Ibid., pp. III-4-III-7.

14. Ibid., p. III-5.

15. Ibid., pp. III-5-III-6.

16. Ibid., p. III-6.

17. Ibid.

18. Ibid., p. II-7.

19. Ibid., p. III-8.

20. Ibid.

21. Ibid., p. III-10.

22. The Joint Chiefs of Staff, Joint Theater Missile Defense CONOPS, p. 5.

23. The Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense, p. III-11.

24. Ibid.

25. Ibid.

26. Ibid., p. III-12.

27. Ibid., p. III-16.

28. Ibid.

29. Ibid.

30. Ibid., p. III-17.

31. The Joint Chiefs of Staff, Joint Theater Missile Defense CONOPS, p. 45.

32. Ibid., p. 24.

33. Ibid.

34. Ibid., p. 25.

35. Ibid., p. 26.

36. Ibid., p. 28.

37. Ibid., p. 47.

38. Ibid., p. 30.

39. Ibid., pp. 30-31.

40. Ibid., p. 31.

41. Ibid., p. 32.

42. Ibid., p. 12.

43. Col John Moorman, Ballistic Missile Defense Organization, "Theater Missile Defense Program Overview," briefing to the USAWC on 28 November 1995.

44. Scott T. Hutchinson, "Army and Navy Theater Missile Defense - Protecting the Force," Military Review, (March-April 1995): p. 53.

45. Robert M. Soofer, "Joint Theater Missile Defense Strategy," Joint Forces Quarterly, (Autumn 1995): p. 74.

46. General Ronald R. Fogleman, "Theater Ballistic Missile Defense," Joint Forces Quarterly, (Autumn 1995): p. 76.

47. Ibid.

48. Ibid.

49. LTC Patrick D. Mace, "Finding the Needle in the Haystack," ADA Magazine, (November-December 1995): p. 19.

50. Ibid., p. 21.

51. Fogleman, p. 78.

52. MG Ronald E. Adams, "Protecting the Force, Army Aviation and Theater Missile Defense," ADA Magazine, (November-December 1994): p. 19.

53. Ibid.

54. LTG Jay M. Garner, "Force Projection TOC; A Command and Control Solution," ADA Magazine, (November-December 1995): p. 15.

55. Fogleman, p. 76.

56. Garner, p. 12.

57. Ibid., p. 15.

58. Fogleman, p. 79.

59. Ibid.

60. Ibid.

BIBLIOGRAPHY

Adams, MG Ronald E. "Protecting the Force; Army Aviation and Theater Missile Defense," ADA Magazine, (November-December 1994): 18-19.

Carus, W. Seth. "Ballistic Missiles in the Third World," The Washington Papers - Center for Strategic and International Studies, Washington D.C., New York: Praeger, 1990.

Fogleman, GEN Ronald R. "Theater Ballistic Missile Defense," Joint Forces Quarterly, no.9 (Autumn 95): 75-79.

Garner, LTG Jay M. "Working at Top Speed to Bolster Theater Missile Defense," Army Magazine, October 1995): 149-150.

Garner, LTG Jay M. "Force Protection TOC; A Command and Control Solution," ADA Magazine, (November-December 1995): 12-15.

Garner, LTG Jay M. "Army Theater Missile Defense," Army Magazine, (December 1995): 16-19.

Hutchinson, Scott T. "Army and Navy Theater Missile Defense - Protecting the Force," Military Review, (March-April 1995): 50-57.

Lennox, Duncan. "Missile Race Continues, " Janes Defense Weekly 19, no.4 (23 January 1993): 18-21.

Mace, LTC Patrick D. "Finding the Needle in the Haystack," ADA Magazine, (November-December 1995): 19-21.

Moorman, Col John, "Theater Missile Defense Program Overview," Ballistic Missile Defense Organization, briefing for the Army War College, (28 November 1995).

Peterson, LTC Joseph F. H. Ballistic Missile Proliferation A National Security Focus for the 21st Century, Strategic Research Project, U.S. Army War College, Carlisle Barracks, PA: 18 April 1994.

Soofer, Robert M. "Joint Theater Missile Defense Strategy," Joint Forces Quarterly, no.9 (Autumn 95): 70-74.

Steinweg, Kenneth K., William R. Betson, Jeffrey A. Matt, Richard F. Riccardelli, Carmen J. Spencer, and Michael N. Ward, Weapons of Mass Destruction: Title 10 Implications, Center for Strategic Leadership, U.S. Army War College, Carlisle Barracks, PA, August 1994.

Youngman, CPT Daryl R. Theater Missile Defense; Advanced Warfighting Experiment Top TRADOC Priority," ADA Magazine, (November-December 1994): 20-21.

U.S. The Joint Chiefs of Staff. Joint Doctrine for Theater Counterair Operations. Joint Pub 3-01.2. Washington: U.S. The Joint Chiefs of Staff, 1 April 1986.

U.S. The Joint Chiefs of Staff. Doctrine for Joint Theater Missile Defense. Joint Pub 3-01.5. Washington: U.S. The Joint Chiefs of Staff, 30 March 1994.

U.S. The Joint Chiefs of Staff. Joint Theater Missile Defense Conops. J-36. Washington: U.S. The Joint Chiefs of Staff, 1 February 1995.

U.S. Department of the Army. Operations. Field Manual 100-5. Washington: U.S. Department of the Army, 14 June 1993.

U.S. Department of the Army. Decisive Force: The Army in Theater Operations. Field Manual 100-7. Washington: U.S. Department of the Army, 31 May 1995.

U.S. Department of the Army. Army Theater Missile Defense Operations (Initial Draft). Field Manual 100-12. Washington: U.S. Department of the Army, 30 September 1995.